

Remarks

Claims 1-25 are pending in the present application. Claim 1-25 are rejected under 35 U.S.C. §102(b) as being anticipated by Hertl et al. (U.S. Patent No. 5,417,947). Claims 1-25 are also rejected under 35 USC §103(a) as being unpatentable over Hertl in view of Minami et al. (U.S. Patent No. 5,140,811.)

The present invention provides a method for removing hydrocarbons from an exhaust gas of an internal combustion engine. Specifically, the present invention recognizes the importance of utilizing a hydrocarbon-removing material such as a zeolite with an appropriate Si to Al atom ratio such that desorption of less than 50% of adsorbed hydrocarbons occurs at less than 250 °C. The method of the invention comprises contacting an exhaust gas with a water-removing composition and then contacting the exhaust gas at a position downstream from the water-removing composition with a hydrocarbon-removing material to remove hydrocarbons from the exhaust gas. The hydrocarbon-removing material use in the present invention has a sufficiently low Si to Al atom ratio that less than 50% of the low molecular hydrocarbons desorb from the hydrocarbon-removing composition at a temperature of 250°C.

a. Rejection Under 35 U.S.C. §102(b)

Claim 1-25 are rejected under 35 U.S.C. §102(b) as being anticipated by Hertl et al. (U.S. Patent No. 5,417,947).

Applicants respectfully disagree with the Examiner for the reasons set forth below. Hertl does not anticipate the present invention because Hertl does not disclose every element of the invention. (see for example, *Akzo N.V. v. United States Int'l Trade Comm'n*, 1 USPQ 2d 1241, 1245 (Fed. Cir. 1986), cert. denied, 482 U.S. 909 (1987).) Specifically, Hertl does not teach the utilization of a hydrocarbon-removing material having “a sufficiently low Si to Al atom ratio that less than about 50% of the low molecular weight hydrocarbons

desorb from the hydrocarbon-removing material at a temperature of about 250°C” as required by independent claims 1 and 14 of the present invention. Instead, Hertl discloses the importance of high ratios:

Some preferred zeolites are faujasite type, especially preferred of which is ultra stable Y, (USY) preferably with $\text{SiO}_2 / \text{Al}_2 \text{O}_3$ mole ratios of **greater than about 5**, pentasil type, preferred of which are ZSM type such as ZSM-5, most preferred of which have $\text{SiO}_2 / \text{Al}_2 \text{O}_3$ mole ratios of **greater than about 25**, and mordenite, and beta zeolite, and combinations of these.

(Hertl, col. 4, ll. 5-11, emphasis added)

The Examiner’s argument that “one skilled in the art would recognize from the teaching of Hertl et al. that the engine exhaust temperature would dictate what type of zeolite is used, and that desorption at lower than the temperature at which the hydrocarbon conversion catalyst operates should be avoided . . . ” is contradicted by the teachings of Hertl. Hertl completely misses the importance of low Si to Al atom ratios and instead teaches that it is important to have high ratios. Therefore, claims 1 and 14 are not anticipated by Hertl.

Accordingly, since Hertl does not anticipate independent claims 1 and 14, dependent claims 2-13 which depend from claim 1 and dependent claims 14-25 which depend from claim 14 are also not anticipated by Hertl.

b. Rejection Under 35 USC §103(a)

Claims 1-25 are also rejected under 35 USC §103(a) are being unpatentable over Hertl in view of Minami et al. (U.S. patent no. 5,140,811.)

Applicants respectfully disagrees with the Examiner's rejection under 103(a) for the following reasons. Minami discloses an exhaust gas purification device for automotive applications. The device of Minami includes a hydrocarbon absorber for that operate up to a first gas temperature (such as 200 °C). (Minami, Abstract). The purification device of Minami then release the absorbed hydrocarbons in the exhaust gas above a second gas temperature (such as 400 °C.) The exhaust gases bypass the hydrocarbon absorber when " the temperature detected by said temperature detection means is at or above said first temperature and not higher than a second temperature." (Minami, col. 2, ll. 60-65.) Specifically, Minami states that this bypassing of the hydrocarbon absorber should occur and therefore the absorber operated "until the temperature of the exhaust gas rises not to be higher than 300 °C., more desirably not to be higher than 250 ° C." (Minami, col. 4, ll. 50-53.) The present invention does not require such a bypassing of the absorber. Instead, by recognizing (which Minami does not) that modern catalysts do not require such a high temperature of operation, the present invention allows for a simpler design in which bypass channels are not necessary.

As set forth above, Hertl does not teach the utilization of a hydrocarbon-removing material having "a sufficiently low Si to Al atom ratio that less than about 50% of the low molecular weight hydrocarbons desorb from the hydrocarbon-removing material at a temperature of about 250°C" as required by independent claims 1 and 14. Similarly, Minami also does not teach a similar limitation. Instead, Minami would bypass the zeolite at the temperature specified in independent claims 1 and 14. If anything, Minami teaches away from the advantages of the present invention in which efficient operation of the catalyst converter is realized by having "less than about 50% of the low molecular weight hydrocarbons desorb from the hydrocarbon-removing material at a temperature of about 250°C." (Present application, claims 1 and 14.) Because both Hertl and Minami fail to teach this important limitation, independent claims 1 and 14 of the present invention are patentable over Hertl in view of Minami.

Accordingly, since independent claims 1 and 14 are patentable over Hertl in view of Minami, dependent claims 2-13 which depend from claim 1 and dependent claims 14-25 which depend from claim 14 are also patentable.

Conclusion

Applicants have made a genuine effort to respond to each of the Examiner's rejections in advancing the prosecution of this case. Applicants believe that all formal and substantive requirements for patentability have been met and that this case is in condition for allowance, which action is respectfully requested. If a telephone or video conference would help expedite allowance or resolve any additional questions, such a conference is invited at the Examiner's convenience.

Applicants believe that no additional fees are required as a result of the filing of this paper. However, the Examiner is authorized to charge any additional fees or credits as a result of the filing of this paper to Ford Global Technologies, Inc.'s Deposit Account No. 06-1510 as authorized by the original transmittal letter in this case. If a telephone or video conference would help expedite allowance or resolve any additional questions, such a conference is invited at the Examiner's convenience.

Respectfully submitted,

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